STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

January 28, 1988

Mr. Don Ostler
Division of Environmental Health
Bureau of Water Pollution Control
P.O. Box 16690
Salt Lake City, Utah 84116-0690

Dear Mr. Ostler:

Re: Mine and Reclamation Plan Review, Cane Creek Potash Mine, M/019/005, Moab Salt, Inc., Grand County, Utah

Mr. Loren Morton and Mr. Steven McNeal of your staff recently reviewed the above referenced plan with respect to water quality issues. Their review was very comprehensive and we have included most of their concerns and comments into our review letter to Moab Salt, Inc. (formerly Texasgulf, Inc.).

A copy of our review letter is enclosed. In Attachment A we have pinpointed three items concerning brine seepage which we believe fall more under your jurisdiction and expertise. If it is agreeable to you, we would like to have the Bureau of Water Pollution Control assume the permit lead on these items and deal directly with Moab Salt, Inc., on them. It is also my understanding that any plans for a dam in the canyon collection system would require approval of both of our agencies as well as Dam Safety. Please let me know if this proposed division of regulatory responsibility is acceptable.

Both my staff and I thank you for the excellent review which Loren and Steve provided on the plan. We hope that their schedule will allow them to stay involved in the permit review for this mine operation.

Sincerely,

Lowell Braxton, Administrator
Mineral Resource Development
and Reclamation Program

re
enclosure
cc: J. Huizingh, Moab Salt, Inc.
1068R-73

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January 28, 1988

Mr. James H. Huizingh
General Manager
Moab Salt, Inc.
P.O. Box 1208
Moab, UT 84532

Dear Mr. Huizingh:

Re: Mine and Reclamation Plan Review, Cane Creek Potash Mine, M/019/005, Grand County, Utah

We have completed our review of the revised mine and reclamation plan for the Cane Creek Potash Mine. As you are aware, the Bureau of Water Pollution Control has also reviewed the plan at our request. A copy of their review is enclosed with this letter. Both of our agencies agree that the plan has been well prepared and we extend our compliments to you and your staff.

We do have a number of concerns with the present operation and with the proposed reclamation plan. Most of this concern centers around brine losses and possible salt discharge into the Colorado River.

Attachment A contains a list of additional items that we will require from Moab Salt, Inc. Many of these items are long term projects and we do not want to delay permit approval until they are implemented. At this time, we will need to have your company provide a schedule with specific dates listed for achieving each of the required items. The items are listed in roughly the order of priority with the first items being the most important from our viewpoint. If you would like clarification of any of the required items, please contact me and we can discuss the item in more detail.

Attachment B contains a list of questions that must be answered before we can give tentative plan approval. If the answers to these questions indicate that a potential problem exists, we may have to require that additional studies be made or measures implemented. Any such requirements should not delay plan approval. We believe that the plan is conceptually sound and that many of the details can be worked out in the future.

An asterisk has been placed next to those items on Attachment A for which we believe that the Bureau of Water Pollution Control has more expertise and also more regulatory jurisdiction. We will formally request that they act as the lead review agency on these matters.

Recommendations have been included in the attachments wherever possible. These recommendations do not contain specific design criteria. I strongly encourage you to consult with the staff at both this Division and the Bureau of Water Pollution Control during the design stages. Names and phone numbers are listed below.

Oil, Gas and Mining, PH: 538-5340

Frank Filas, Soils and Engineering
David Wham, Hydrology

Water Pollution Control, PH: 538-6146

Loren Morton, Ground Water Hydrology
Steven McNeal, Surface Water Hydrology

The schedule for the items on Attachment A and the responses to the questions on Attachment B should be submitted as soon as possible, but no later than April 20, 1988. A copy of these submittals should also be sent to Mr. Don Ostler of the Bureau of Water Pollution Control at the same time. An updated bond estimate including any major changes in the plan will also be necessary. This estimate will not be needed until the plan receives tentative approval.

Thank you for your patience and cooperation in this matter.

Sincerely,

Lowell Braxton

Lowell Braxton, Administrator
Mineral Resource Development
and Reclamation Program

re
cc: Loren Morton, Water Pollution Control
Steve McNeal, Water Pollution Control
Frank Filas
David Wham
1068R-74-75

Attachment A
Items Required

1. It is apparent that the canyon collection system below the evaporation ponds is not entirely effective in controlling salt laden runoff and seepage into the Colorado River. We will require that a plan be submitted for improving water control in this area.

   In order to control both underground and surface water, we recommend that an engineered dam be constructed down to bedrock in the canyon. We also recommend that the amount of brine seepage through this area be quantified both before and after plan implementation.

2. * Interceptor wells have been installed along one of the faults which lies under the salt storage area. We will require that a similar well(s) be placed along the fault which underlies the brine lake unless it can be conclusively demonstrated that no seepage is possible along this fault. Additional wells may also be needed in the future if a seepage problem is indicated.

3. * The plan does not contain brine water balances. We will require that a water balance be submitted for each major component of the site so that any brine leakage can be located, quantified, and eventually mitigated.

   The information necessary to prepare water balances may be readily available to you from records that you have kept on site. If not, we recommend that a monitoring system be set up that will allow quick and accurate collection of the necessary data. We also recommend that water samples be taken from the river, both immediately above and below the site. These samples will help identify current levels of salt contributions to the river and provide a benchmark to judge the effectiveness of future mitigation practices.

4. * The design plans for the catch pond below the brine lake dam must be submitted. We would also like to see copies of the reports for the grouting of the open joints in the foundation of the reservoir and in the dam abutments.

   The above referenced plans should be evaluated in conjunction with the brine water balance. If a seepage problem is indicated, it may be necessary to modify the catch pond or to construct intercept wells down gradient from the catch pond.

5. The leaching of the proposed landfill was strongly objected to by the Department of Environmental Health. We will require that an alternate plan be proposed or a commitment to the following:

   a. Lining the landfill; and,

   b. limiting the amount of salt placed into the landfill as much as is practical; and,

   c. constructing and operating the landfill in accordance with the applicable state and federal regulations in force at the time of reclamation.

6. The design assumptions used for handling of storm water runoff during reclamation are minimum estimates at best. We will require that these systems be redesigned when the canyon collection system is improved and more accurate data is available.

   Note: On page 11-8 you state that runoff from drainages in unaffected areas nearby will be obtained as a standard of comparison to samples from the reclaimed areas. We think that this is a good approach, but wish to make it clear that a discharge permit will probably also be required by other state or federal agencies at the time of reclamation.

7. We will require that Moab Salt demonstrate that subsidence will not be a problem over the 100 year mine life or commit to subsidence monitoring.

   We recommend the second alternative and that permanent, well protected survey stations be installed. A summary of the monitoring results would have to be included with the annual report during those years that a survey is conducted.

8. We will require that a short summary of any water monitoring, brine spills, and liner repairs be submitted each year in the annual report to the Division. The Bureau of Water Pollution Control has also indicated that they would like to have some type of annual/quarterly reporting.

   We also recommend, if not already in place, that a detailed record of water monitoring, spills, liner repairs, etc. be kept at the mine site and be available for inspection by regulating agencies.

re
1068R-70-71

Attachment B
Questions

1. Part 12-2 of the plan states that the salt contaminated soil at the plant site will be leached until the SAR and EC of the first three feet of soil are below 14 and 8 MHOs, respectively.

   a. Why were these MHO levels chosen?

   b. Will the same soil testing and success criteria apply to the evaporation ponds and raw salt storage area?

2. The reclamation plan calls for the leaching of the first three feet of salt contaminated soils in the various mine areas. This is adequate for revegetation purposes. We are concerned, however, that salt concentrations below the three foot level will eventually leach into the Colorado River.

   a. How much salt will be left below the three foot level after leaching?

   b. To what degree will this remaining salt be susceptible to natural leaching after reclamation?

3. What measures are employed at the plant site to minimize salt laden runoff from the salt storage areas and contamination of the ground water?

   Note: We recommend that all salt storage areas at the plant site be underlain with a synthetic liner and surrounded by lined storm drainage collectors.

4. The reclamation plan calls for the building of a leach brine collection trench downgradient of the plant site to collect the leach waters. Is a similar natural leaching of salt laden soils at the plant site occurring at this time?

   Note: If this appears to be a problem, we would recommend that a minimum of three shallow monitoring/collector wells be placed in the proposed trench area at this time.

5. The plan states that the brine lost along the faults of wells TP-1, 2, and 3 is reclaimed by maintaining the local water table below river level. Since the brine is considerably denser than the river water, it is necessary that the brine level be kept a substantial amount below the river level. Is this being done? (Please attach calculations to show that the maintained level is adequate.)